WHAT IS CLAIMED IS:

1. A method for reducing tone scale of a video, said video having a plurality of frames, each of the frames having a plurality of pixels, the method comprising the steps of:

adding a cumulative diffused error to an initial tone value of a base pixel of a current frame of said video to provide an adjusted tone value of said base pixel;

assigning a threshold to said base pixel;

quantizing said adjusted tone value using said threshold, said quantizing generating a quantization error;

diffusing first portions of said quantization error to one or more pixels of one or more succeeding frames temporally neighboring said current frame and second portions of said quantization error to one or more pixels spatially neighboring said base pixel;

totalling said portions diffused to each said neighboring pixel to provide a respective cumulative diffused error;

iterating said assigning, quantizing, and diffusing steps with one of said neighboring pixels as base pixel until all of the pixels on all of the video frames are processed.

2. The method of Claim 1 further comprising adaptively adjusting said threshold during said iterating.

3. The method of Claim 2 wherein said adaptively adjusting further comprises:

determining motion fields between said current frame and said temporally neighboring frames;

generating a gain control map and a temporal diffusion map from said motion fields; and

applying said maps during said quantizing and diffusing steps, respectively.

4. The method of Claim 3 wherein said generating further comprises applying a finite impulse response filter to said motion fields.

5. The method of Claim 2 wherein said adaptively adjusting is a function of the motion between said current frame and said temporally neighboring video frames.

6. The method of Claim 3 wherein said generating of said gain control map further comprises convolving said image intensities with a bandpass/highpass temporal filter.

7. The method of Claim 1 wherein said diffusing of said first portions is along motion trajectories.

8. The method of Claim 7 further comprising bilinearly interpolating at non-integer locations along said motion trajectories.

9. The method of claim 1 wherein said adaptively adjusting is a function of the initial tone values of said base pixel and of temporally neighboring pixels at the same spatial location.

10. The method of Claim 1 further comprising the steps of:

determining motion fields between said current frame and said temporally neighboring frames;

generating a gain control map from said motion fields; and

adaptively adjusting said threshold during said iterating according to said gain control map.

11. The method of Claim 10 further comprising smoothing said gain control map.

12. The method of Claim 10 further comprising generating a temporal diffusion map from said motion fields, said temporal diffusion map defining said neighboring pixels prior to said diffusing.

13. The method of Claim 10 wherein said motion fields are determined by motion estimation computations.

14. The method of Claim 13 wherein said motion estimation computations are gradient-based, region-based, energy-based, or transform-based.

15. The method of Claim 10 wherein said determining motion fields further comprises reading motion vector metadata associated with said frames.

16. The method of Claim 1 further comprising the steps of:

determining motion fields between said current frame and said temporally neighboring frames; and

generating a temporal diffusion map from said motion fields, said temporal diffusion map defining said neighboring pixels prior to said diffusing.

17. The method of Claim 16 further comprising adaptively adjusting said diffusing during said iterating according to said temporal diffusion map.

18. The method of Claim 17 wherein said magnitudes of said first and second portions of said quantization error are adjusted during said iterating proportional to the magnitudes of motion vectors of said motion fields.

19. The method of Claim 1 wherein said diffusing of said first portions and said diffusion of said second portions is separable.

20. Apparatus for reducing tone scale of an initial video having a plurality of frames, said video comprising:

a motion estimation module determining motion vectors between temporally adjacent frames;

a parameter estimation module determining a motion-assisted gain control map and a temporal diffusion map, said gain control map defining a plurality of thresholds, said thresholds being adaptive to said motion vectors; and

a quantization module quantizing the initial video according to said thresholds, said quantizing defining quantization error;

a temporal error diffusion module diffusing first portions of the quantization error along said motion vectors responsive to said diffusion map;

a spatial error diffusion module diffusing second portions of the quantization error spatially.

21. The apparatus of Claim 20 wherein said motion estimation module determines said motion vectors by motion estimation computations.

22. The apparatus of Claim 21 wherein said motion estimation computations are gradient-based, region-based, energy-based, or transform-based.

23. The apparatus of Claim 20 wherein said motion estimation module reads motion vector metadata associated with said frames and determines said motion vectors responsive to said reading.

24. The apparatus of Claim 20 further comprising a display operatively connected to said modules.

25. The apparatus of Claim 24 wherein said display is incapable of displaying said initial video.

26. The apparatus of Claim 25 wherein said display is portable.

27. A system comprising the combination of said apparatus and a source supplying said initial video.

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